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Peropteryx trinitatis Miller, 1899 (Chiroptera, Emballonuridae): first record in central Brazil and revised distribution map

Adriano Silva dos Santos, **Daiana Cardoso Silva** and **Karina de Cassia Faria***

Universidade do Estado de Mato Grosso, Faculdade de Ciências Agrárias, Biológicas e Sociais Aplicadas. Av. Prof. Dr. Renato Figueiro Varella, s/n, CEP 78690-000, Nova Xavantina, MT, Brazil
* Corresponding author. E-mail: karinafaria@unemat.br

Abstract: Reports of *Peropteryx trinitatis* in Brazil are restricted to the northern and northeastern regions. In this study, we extend its known geographic range to include central Brazil, with the first report of *P. trinitatis* in the Cerrado of the state of Mato Grosso. This is the southernmost known record for this species, 900 km from the closest record.

Key words: Dog-like Bat; Cerrado; new record; Mato Grosso

Peropteryx is composed of five species, *P. kappleri* Peters, 1867, *P. leucoptera* Peters, 1867, *P. macrotis* (Wagner, 1843), *P. pallidoptera* Lim et al. 2010, and *P. trinitatis* Miller, 1899 (Solari and Martinez-Arias 2014). *Peropteryx trinitatis* was once considered a subspecies of *P. macrotis* due to both their extensive morphological similarity and to an alleged lack of sympatry (Jones and Hood 1993; Koopman 1993, 1994); however, dental and external morphological comparisons and confirmation that both taxa may occur in sympatry have verified its classification as distinct species (Handley 1976; Brosset and Charles-Dominique 1990; Simmons and Voss 1998).

Peropteryx trinitatis is an insectivorous bat, weighing from 3 to 6 g and with a forearm length ranging from 36 to 43 mm (Hood and Gardner 2008; Lim et al. 2010; Reis et al. 2013). The species is sexually dimorphic, with females usually larger than males (Lim et al. 2010). It has large and wide ears which become slightly narrower at the tip; a conical muzzle, and dark brown to reddish brown fur (Miller 1899; Simmons and Voss 1998). *Peropteryx trinitatis* is known to occur in Aruba, Venezuela, French Guiana, Guyana, Trinidad and Tobago and Brazil; its type locality is Port of Spain, Trinidad (Miller 1889) (Figure 1; Table 1). In these countries, *P. trinitatis* has been found in tropical and subtropical moist broadleaf forests, tropical and subtropical grasslands, savannas and shrublands, and in deserts and xeric shrublands (Figure 1).

There have been few captures of the *P. trinitatis* in Brazil. It has thus far been reported only in the north and northeast regions of the country covering the Brazilian biomes Amazon (states of Amazonas, Amapá and Pará), Caatinga (state of Bahia) and Cerrado savanna (state of Maranhão) (Table 1). Here we report a new record for the Central-West Region of Brazil, in the Cerrado savanna.

We captured two adult male *P. trinitatis* in Mário Viana Municipal Park (14°43′22″ S, 052°21′39″ W), a protected area (492 ha) located in the eastern portion of the Cerrado biome, in the city of Nova Xavantina, state of Mato Grosso. The predominant vegetation type in the municipal park is Cerrado *sensu strictu*, but there are patches of woodland, rocky Cerrado, and a gallery forest (Silva et al. 2008). The climate, according to the Köppen classification is tropical humid (*Aw*), the average annual temperature is 24°C (Vianello and Alves 2000), and mean rainfall is around 1,500 mm, with a dry season between April and September and a rainy season between October and March (Pirani et al. 2009).

The first specimen was captured on 10 May 2014 and the second specimen was captured on 11 April 2015. The captures were performed with the use of 6 × 3 m mist nets set up during the day at the opening to a roost site. The opening was characterized as a gap in a rocky wall within the gallery forest. The permit to collect the specimens was granted by the Chico Mendes Institute for Biodiversity Conservation (ICMBio), Ministry of Environment (Process #18276-1). The specimens were identified following Vizotto and Taddei (1973), Lim and Engstrom (2001), and Simmons and Voss (1998), and deposited in the scientific collection of the Universidade do Estado do Mato Grosso (UNEMAT), campus of Nova Xavantina, under the collection numbers RM 460 and RM 498 (Figure 2).

The dorsum of our *P. trinitatis* specimens were dark

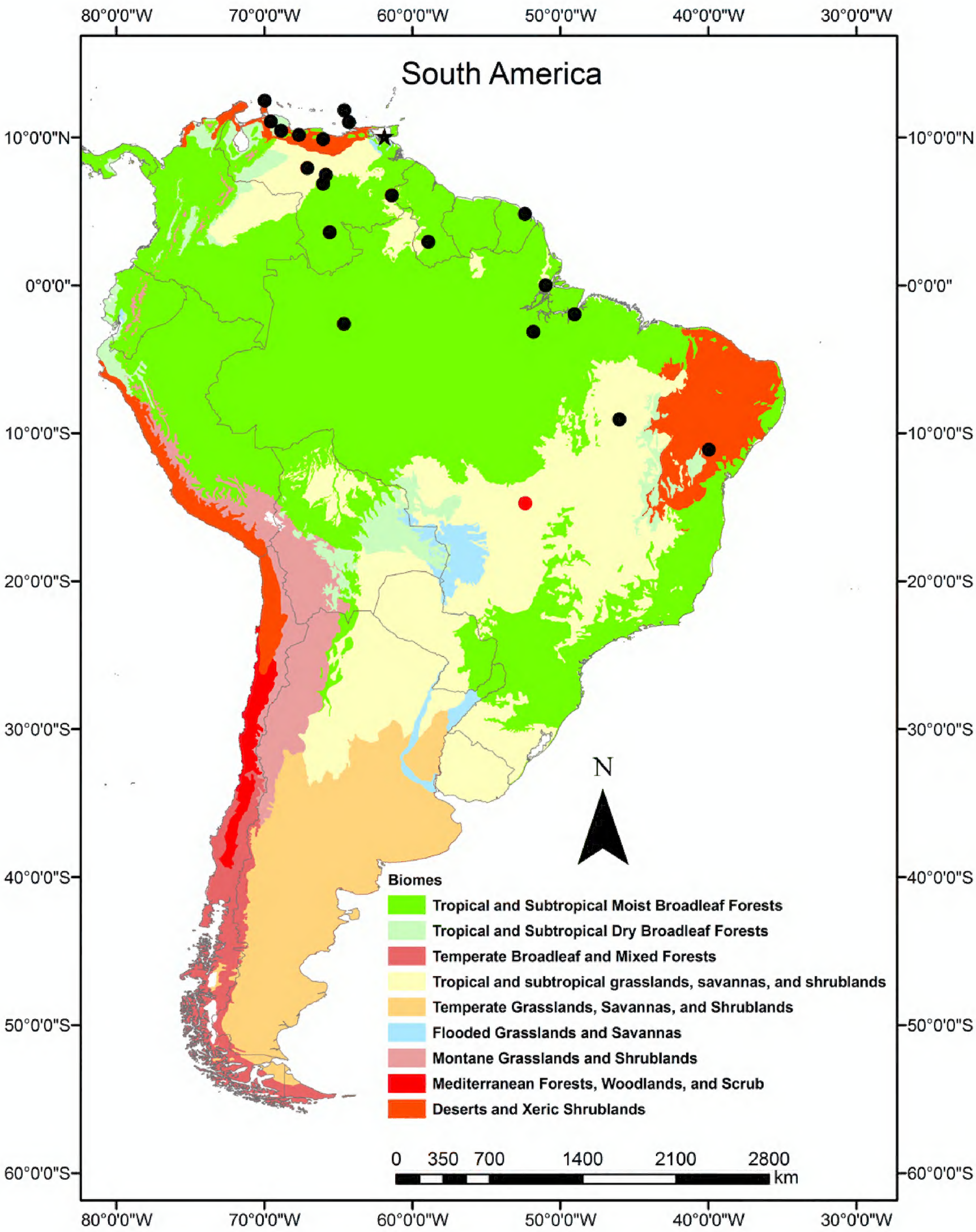

Figure 1. Known geographic distribution of *Peropteryx trinitatis*. The black dots represent previous reports of the species, the star represents the type locality and the red dot represents the first report of the species in central Brazil, in Nova Xavantina, state of Mato Grosso. Biomes classified according to Olson et al. (2001; available at http://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world).

brown in color, while the venters were lighter brown and a reddish tone (Figure 2A). According to Brosset and Charles-Dominique (1990), *P. trinitatis* has a shorter and more round skull than *P. macrotis*. The shape of the skull of the specimens captured in Mato Grosso was similar to those illustrated by these authors (Figure 2B). The anterior upper premolars of our specimens of *P. trinitatis* were peg-like and without well-defined anterior and posterior cusps (Figure 2C), consistent with the description of Simmons and Voss (1998). External and cranial measurements (in mm) were found to be similar to the published morphometric data for *P. trinitatis* with small variations in measurements of thumb, foot, calcaneus, and greatest mandible length (Table 2). The dental formula was I1/3, C1/1, P2/2, M3/3 = 32.

Peropteryx trinitatis is categorized by the IUCN

Table 1. Locations where *Peropteryx trinitatis* is known to occur.

Country	State/department	Locality	Latitude	Longitude	Reference
Aruba		25 kilometer north of the coast of Venezuela	12.488	–69.970	Bekker (1996)
Brazil	Amazonas	Amanã Sustainable Development Reserve	–02.621	–64.616	Marques et al. (2016)
Brazil	Amapá	APA Curiaú, Macapá	00.116	–51.050	Silva et al. (2013)
Brazil	Bahia	Queimadas	–11.110	–39.961	Hood and Gardner (2008)
Brazil	Maranhão	Alto Parnaíba	–09.067	–46.008	Hood and Gardner (2008)
Brazil	Mato Grosso	Mário Viana Municipal Park, Nova Xavantina	–14.722	–52.360	This study
Brazil	Pará	Kararaô Cave	–03.141	–51.818	Zortéa et al. (2015)
Brazil	Pará	Utinga, Belém	–01.958	–49.032	Hood and Gardner (2008)
French Guiana		Cayenne	04.825	–52.382	Brosset and Charles–Dominique (1990)
Guyana	Upper Takutu–Upper Essequibo	12 miles E of Dadanawa	02.945	–58.920	Hood and Gardner (2008)
Trinidad and Tobago	Trinidad	Saint George County, Port of Spain	10.047	–61.883	Miller (1899)
Venezuela	Amazonas	San Juan	06.868	–66.029	Handley (1976)
Venezuela	Apure	8 km NW of Puerto Páez	07.930	–67.092	Handley (1976)
Venezuela	Bolívar	Hato La Florida	07.468	–65.846	Lim et al. (2010)
Venezuela	Bolívar	Rio Caura	03.595	–65.584	Ochoa et al. (2008)
Venezuela	Carabobo	Rio Guárico, Belén	10.167	–67.667	Bisbal and Rodríguez (2010)
Venezuela	Falcón	13 km NNE of Mirimire	11.071	–69.566	Handley (1976)
Venezuela	Miranda	4 km SW of Birongo	09.891	–66.029	Handley (1976)
Venezuela	Nueva Esparta	Margarita Island	11.030	–64.290	Rawlins (2011)

Table 2. External and cranial measurements of *Peropteryx trinitatis*.

	Nova Xavantina, Brazil[1]		Port of Spain, Trinidad [2]	Cayenne, French Guiana [3]		Venezuela [4]	
Sex	**Females**		**Female**	**Male**	**Female**	**Males**	**Females**
Measurements (mm)	**RM 460**	**RM 498**	**N° 7496**	**N° 305**	**N° 595**	**–**	**–**
Forearm	39.2	39.0	40.0	39.5	40.4	38.3	41.5
Thumb	4.1	4.6	7.0	–	–	–	–
Ear	12.3	10.6	11.0	–	–	12.9	12.8
Tibia	17.3	16.1	18.0	–	–	–	–
Foot	5.3	6.1	6.4	–	–	6.9	7.6
Calcaneus	10.4	11.5	17.0	–	–	–	–
Greatest length of skull	14.0	14.5	13.8	13.2	13.2	12.6	13.4
Condylocanine length	12.6	13.2	–	–	–	11.4	12.0
Condylobasal length	13.1	13.9	12.0	–	–	–	–
Maxillary toothrow length	5.0	5.3	5.4	4.8	4.7	4.6	5.0
Zygomatic breadth	7.9	8.0	8.0	7.8	7.7	7.4	7.9
Braincase breadth	6.3	6.4	6.4	–	–	6.0	6.2
Mastoid breadth	7.0	6.9	7.4	–	–	6.8	7.1
Postorbital breadth	2.3	2.8	2.6	2.9	3.0	2.8	2.5
Width across molars	5.7	6.2	–	6.0	6.2	–	–
Width across canines	3.5	3.3	–	–	–	–	–
Greatest of length mandible	8.5	8.8	9.4	9.4	9.3	–	–
Weight (g)	5.0	4.9	–	4.0	4.4	3.6	4.1

Present study[1], Miller–Jr. (1899)[2], Brosset and Charles–Dominique (1990)[3] and Lim et al. (2010)[4].

(International Union for Conservation of Nature) (Sampaio 2016) and by Brazilian Ministry of the Environment (MMA 2014) as Data Deficient because of the lack of knowledge on its current range, and also because of the need for more information on its biology and ecology. The species is considered to be uncommon throughout its geographic range (Emmons and Feer 1990).

This capture is the first report of the species in the state of Mato Grosso and central Brazil. It expands the known distribution range of this species about 900 km south from the closest record in the Brazilian state of Maranhão (Table 1). This finding emphasizes the need for more studies in areas that are currently lacking information on species richness, such as eastern Mato Grosso state.

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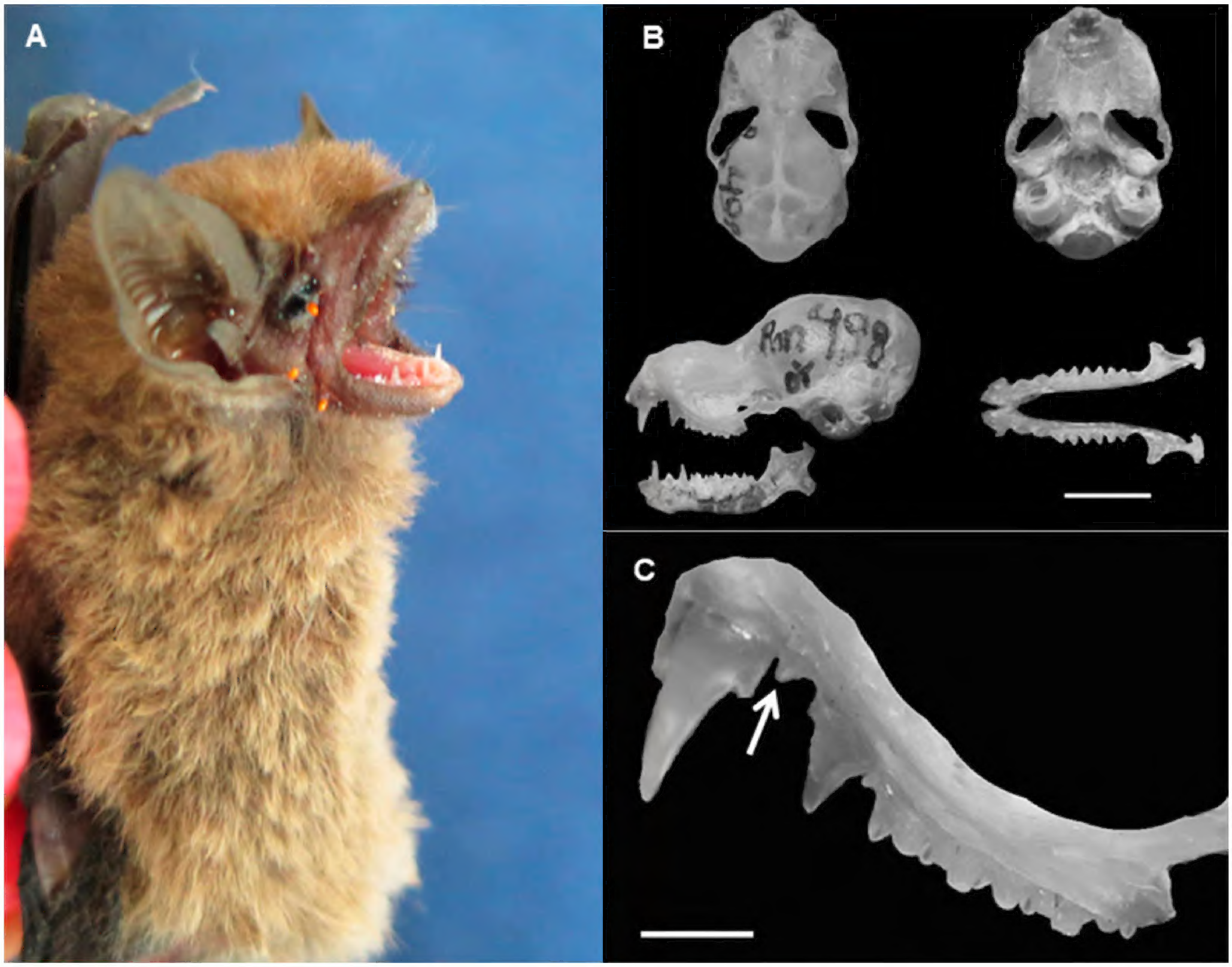

Figure 2. *Peropteryx trinitatis* (RM 498) captured in Nova Xavantina, Mato Grosso State, Brazil. **A.** Adult male. **B.** Dorsal, ventral and lateral views of skull and lateral and ventral views of mandible. Scale bar = 4.4 mm. **C.** Close-up lateral view of its upper right dentition (the arrow indicates the anterior upper premolar). Scale bar = 1.2 mm.

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